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Ariyama

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(54) **IMAGE PROCESSING DEVICE, IMAGE PROCESSING METHOD, COMPUTER PROGRAM AND COMPUTER-READABLE RECORDING MEDIUM**

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G06K 9/40 (2006.01)
G06K 9/00 (2006.01)
G06K 9/03 (2006.01)

(52) **U.S. Cl.**
CPC ***G06K 9/00624*** (2013.01); ***G06K 9/036*** (2013.01)

(58) **Field of Classification Search**
CPC G06K 9/036; G06K 9/00624; G06K 9/00; G06K 9/2054; G06K 7/146; G06T 2207/10016; G06T 7/0083
USPC 382/167, 181, 190, 254, 274, 275, 305, 382/312; 358/1.9
See application file for complete search history.

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(57) **ABSTRACT**

There is provided an image processing device including an image quality configuring part configured to configure image quality on a per-recognizable scene of an image basis according to an instruction from a user, an image quality storage configured to store the image quality configured for each scene, an image recognition part configured to recognize a scene of an image to be acquired, and an image processing part configured to perform image processing on the image based on the image quality configured for the recognized scene by the image quality configuring part.

13 Claims, 7 Drawing Sheets

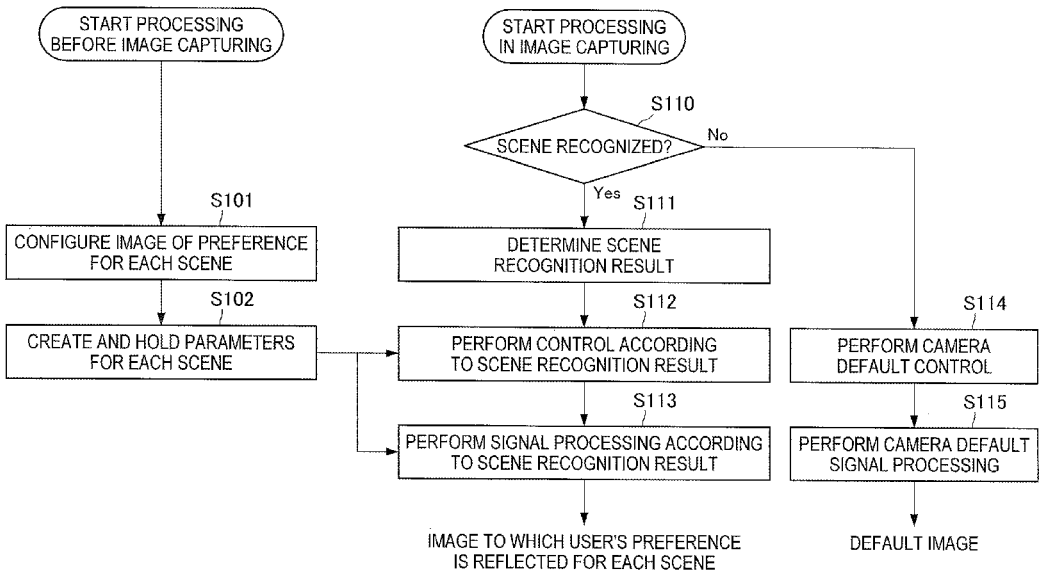

FIG.1

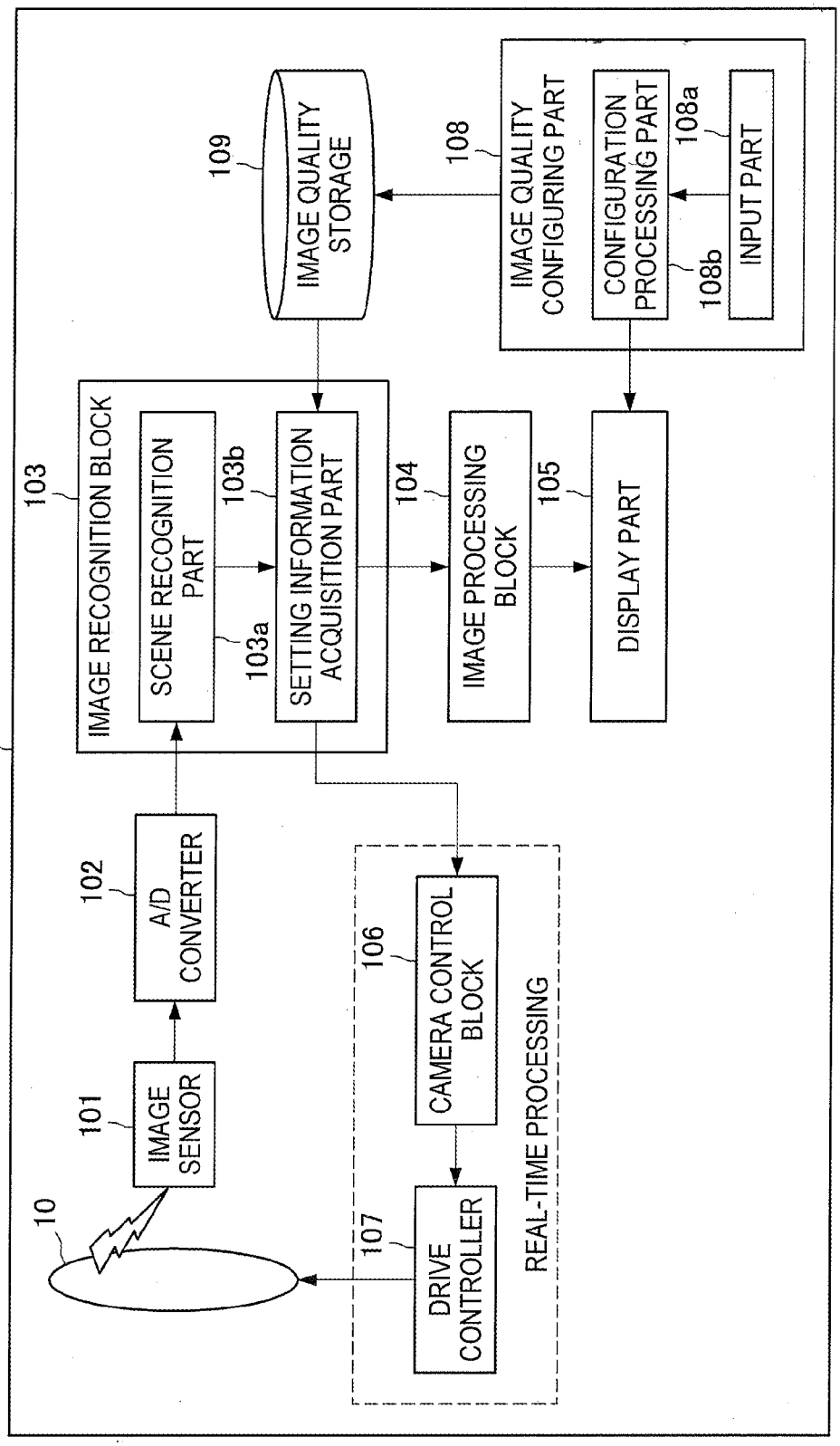
100
IMAGE RECOGNITION BLOCK
103
SCENE RECOGNITION PART
103a
103b
SETTING INFORMATION ACQUISITION PART
104
IMAGE PROCESSING BLOCK
105
DISPLAY PART
IMAGE QUALITY STORAGE
109
IMAGE QUALITY CONFIGURING PART
108
CONFIGURATION PROCESSING PART
108a
108b
INPUT PART
A/D CONVERTER
102
IMAGE SENSOR
101
10
CAMERA CONTROL BLOCK
106
DRIVE CONTROLLER
107
REAL-TIME PROCESSING

FIG.2

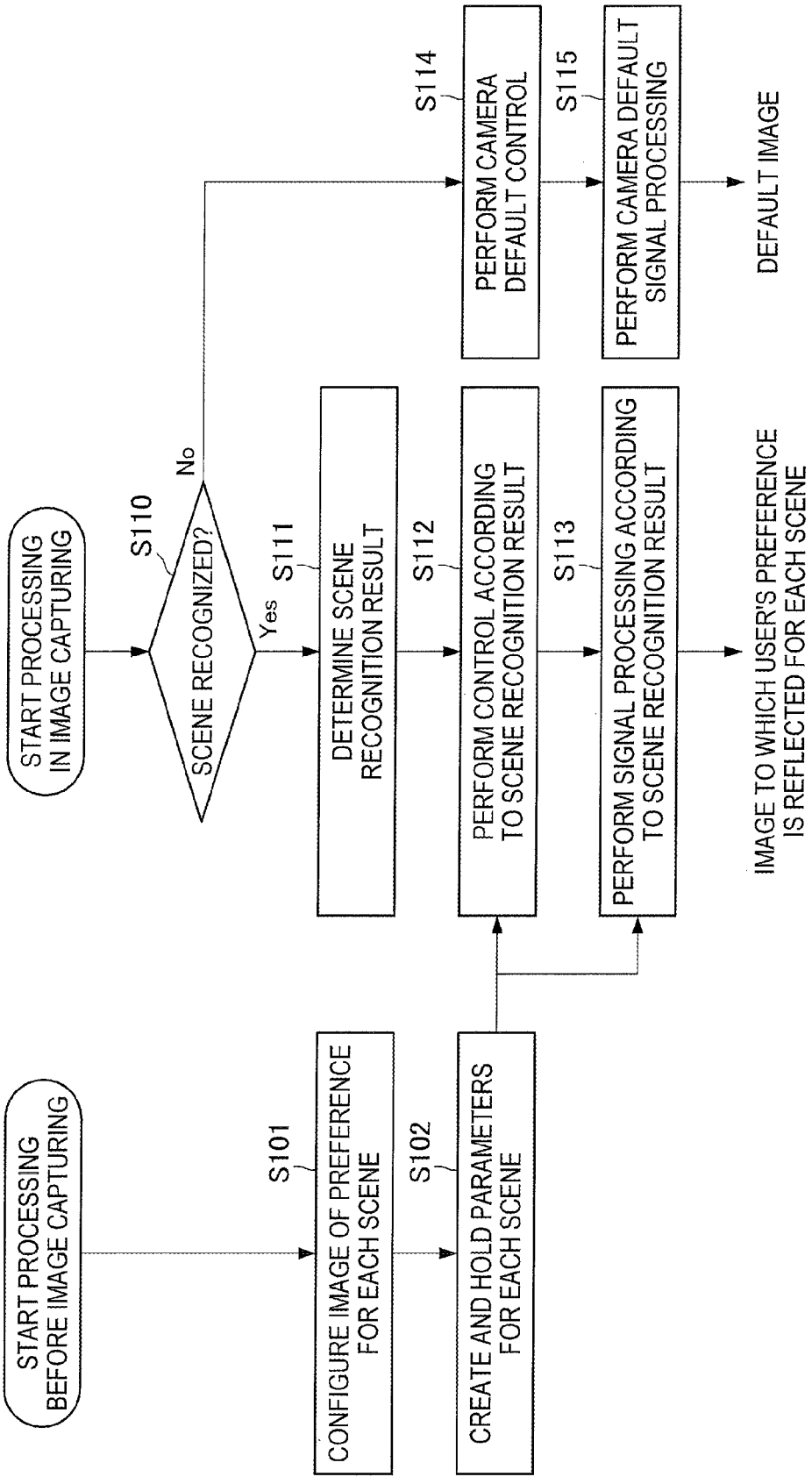
START PROCESSING BEFORE IMAGE CAPTURING
S101
CONFIGURE IMAGE OF PREFERENCE FOR EACH SCENE
S102
CREATE AND HOLD PARAMETERS FOR EACH SCENE
START PROCESSING IN IMAGE CAPTURING
S110
SCENE RECOGNIZED?
Yes
No
S111
DETERMINE SCENE RECOGNITION RESULT
S112
PERFORM CONTROL ACCORDING TO SCENE RECOGNITION RESULT
S113
PERFORM SIGNAL PROCESSING ACCORDING TO SCENE RECOGNITION RESULT
IMAGE TO WHICH USER'S PREFERENCE IS REFLECTED FOR EACH SCENE
S114
PERFORM CAMERA DEFAULT CONTROL
S115
PERFORM CAMERA DEFAULT SIGNAL PROCESSING
DEFAULT IMAGE

FIG.3

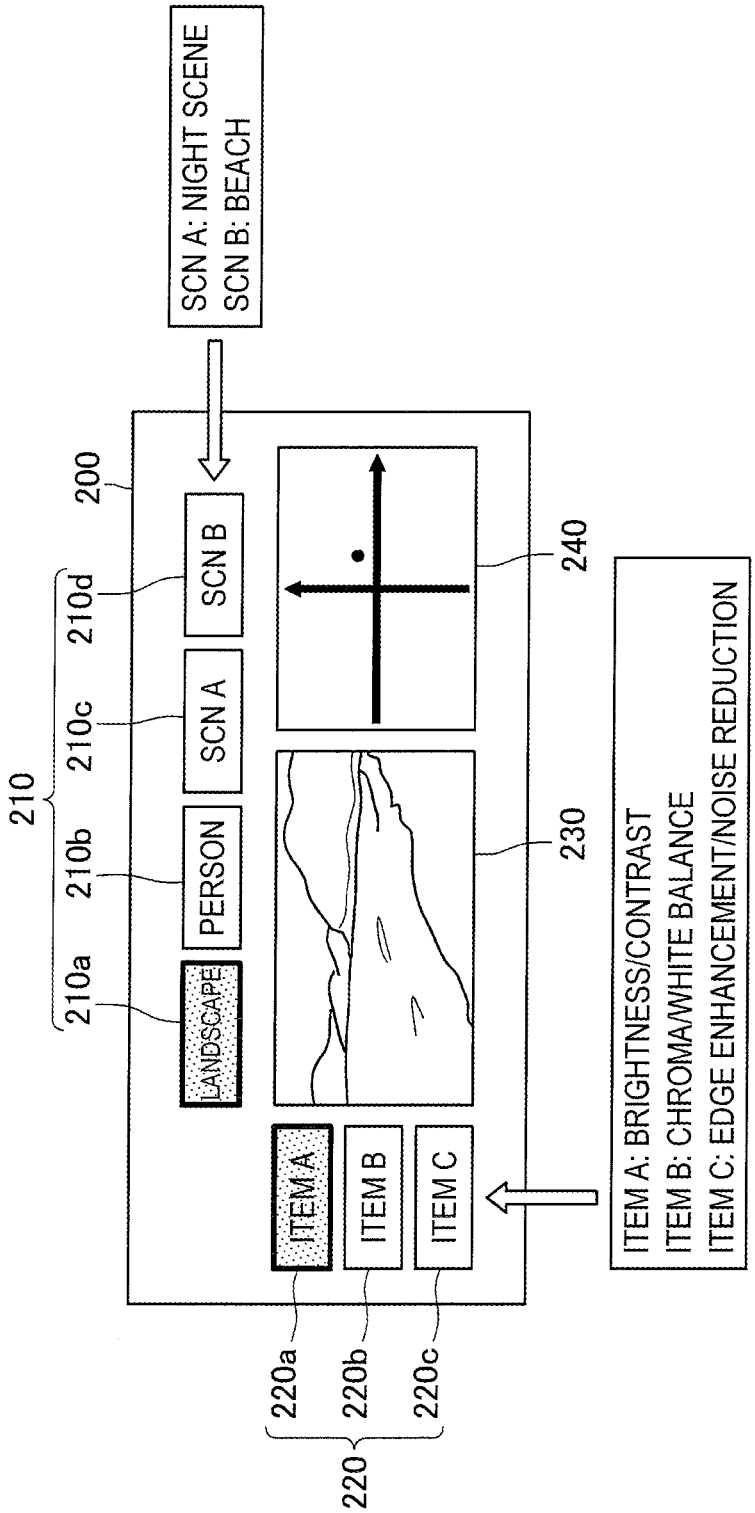
SCN A: NIGHT SCENE
SCN B: BEACH
200
210
210a
210b
210c
210d
LANDSCAPE
PERSON
SCN A
SCN B
240
230
ITEM A
ITEM B
ITEM C
220a
220b
220c
220
ITEM A: BRIGHTNESS/CONTRAST
ITEM B: CHROMA/WHITE BALANCE
ITEM C: EDGE ENHANCEMENT/NOISE REDUCTION

FIG.4

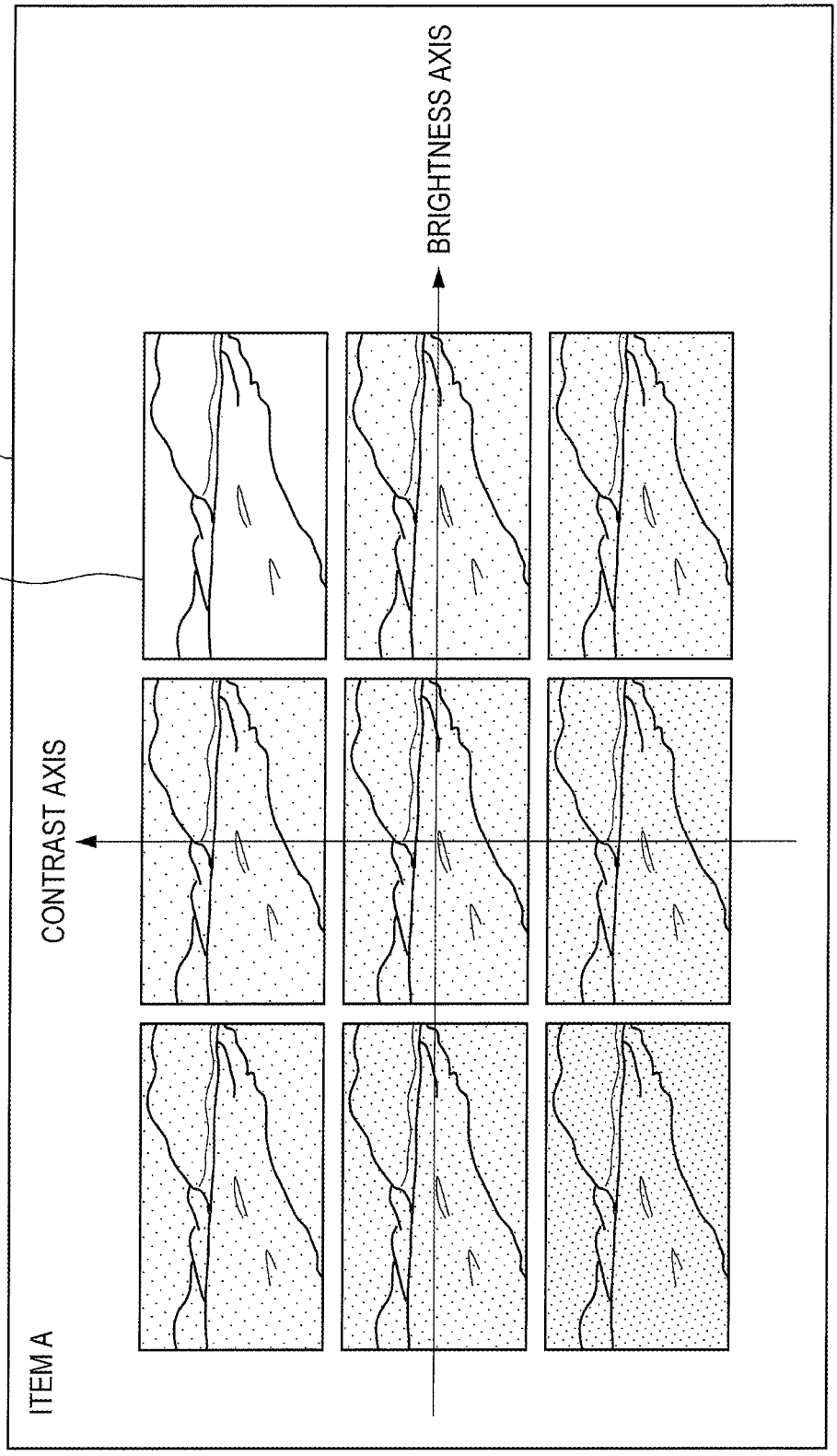

FIG.5

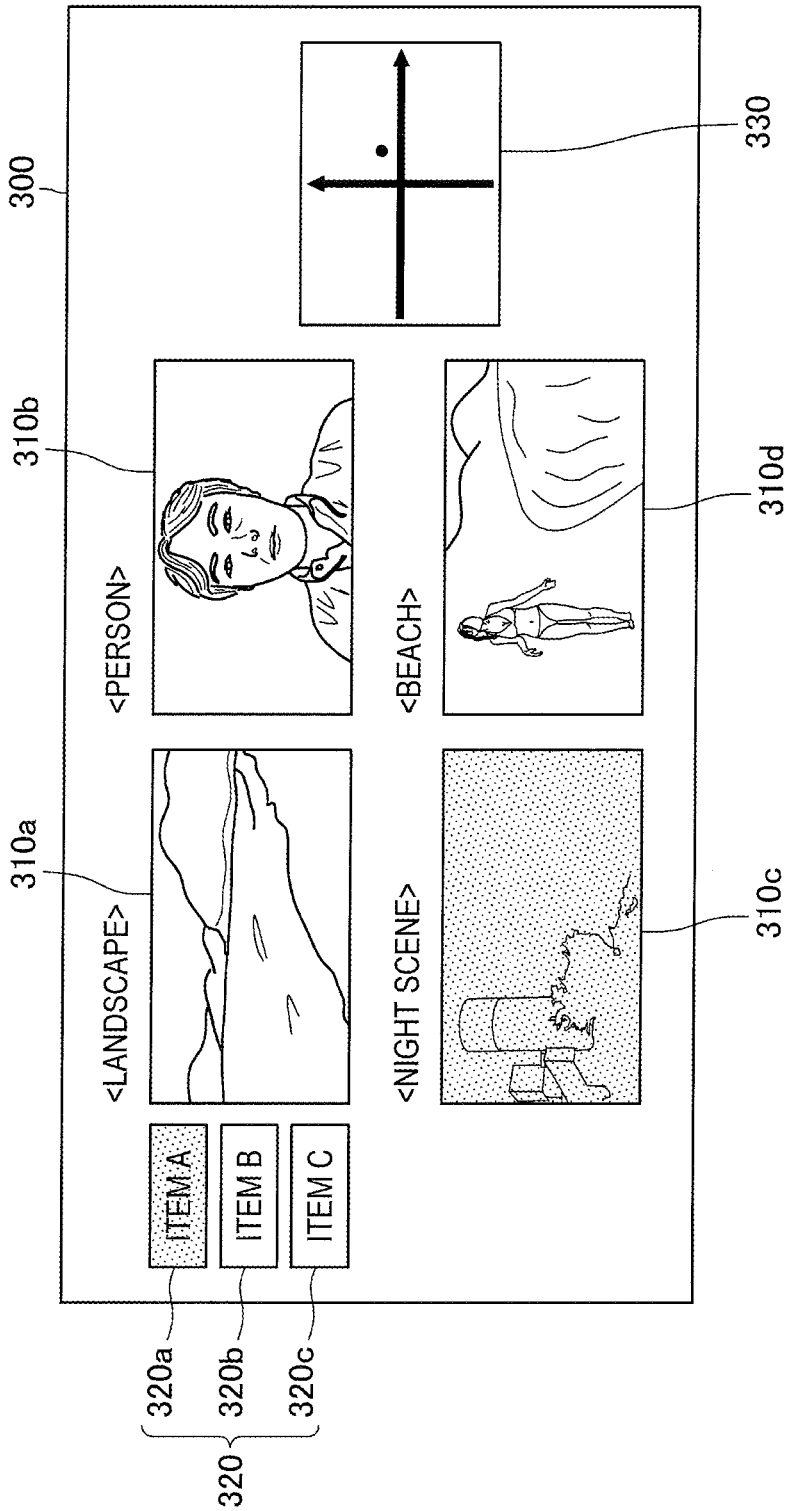
300
330
310b
<PERSON>
<BEACH>
310d
310a
<LANDSCAPE>
<NIGHT SCENE>
310c
ITEM A
ITEM B
ITEM C
320a
320b
320c
320

FIG.6

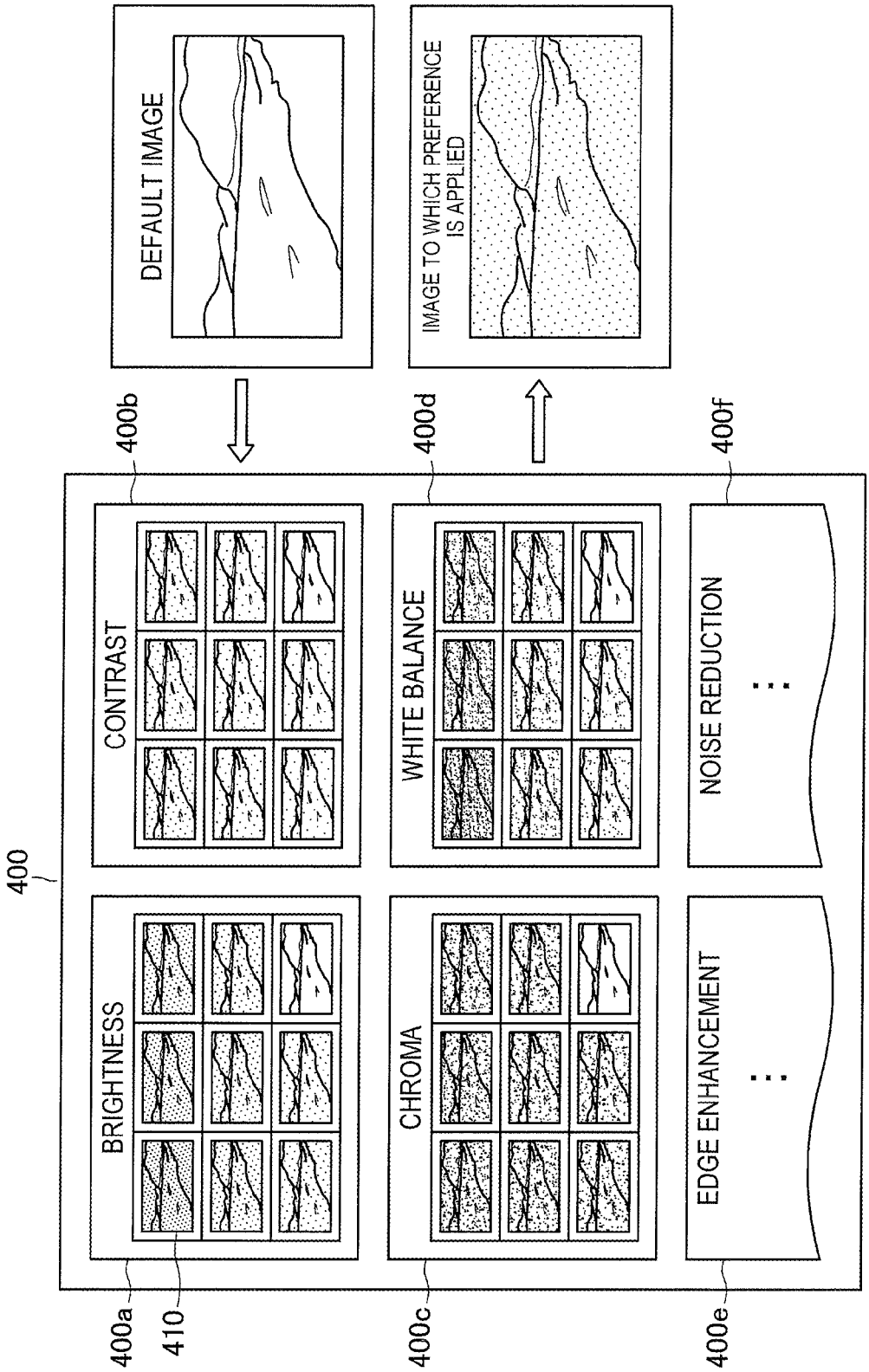
DEFAULT IMAGE
IMAGE TO WHICH PREFERENCE IS APPLIED
400
400b
400d
400f
CONTRAST
WHITE BALANCE
NOISE REDUCTION
BRIGHTNESS
CHROMA
EDGE ENHANCEMENT
400a
410
400c
400e

FIG.7

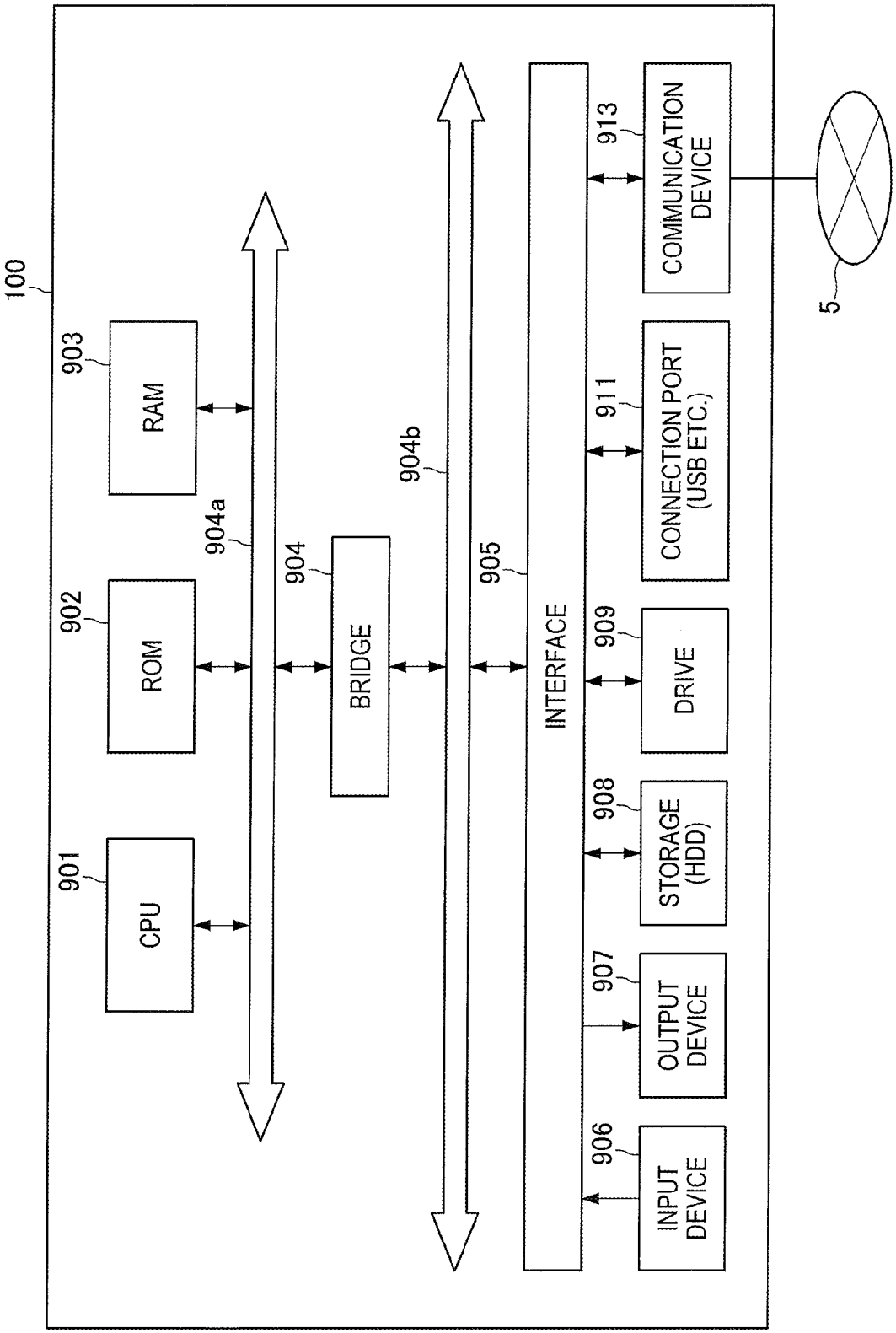
100
901
CPU
902
ROM
903
RAM
904
BRIDGE
904a
904b
905
INTERFACE
906
INPUT DEVICE
907
OUTPUT DEVICE
908
STORAGE (HDD)
909
DRIVE
911
CONNECTION PORT (USB ETC.)
913
COMMUNICATION DEVICE
5

IMAGE PROCESSING DEVICE, IMAGE PROCESSING METHOD, COMPUTER PROGRAM AND COMPUTER-READABLE RECORDING MEDIUM

BACKGROUND

The present disclosure relates to an image processing device, an image processing method, a computer program and a computer-readable recording medium.

Image capturing devices which can recognize status of the subject whose image is to be captured are increasing recent years. Such image capturing devices perform preset camera control and signal processing according to individual scenes such as a landscape, a person and a night scene whose images are to be captured.

SUMMARY

However, camera control and signal processing preset in existing image capturing devices do not reflect intentions of users, but are merely designed by individual designers of manufacturers of the image capturing devices. For example, Japanese Patent Application Publication No. 2000-069416 discloses a digital camera which can acquire an image having picture imagery of preference by the user designating the imagery for image generation with designation tools. However, the digital camera according to Japanese Patent Application Publication No. 2000-069416 acquires images having the same picture imagery for all the scenes and is significantly difficult to configure settings of user's preference for each scene.

Therefore, the present disclosure proposes an image processing device, an image processing method, a computer program and a computer-readable recording medium which are novel and improved and using which the user can configure images of preference for individual scenes.

According to an embodiment of the present disclosure, there is provided an image processing device including an image quality configuring part configured to configure image quality on a per-recognizable scene of an image basis according to an instruction from a user, an image quality storage configured to store the image quality configured for each scene, an image recognition part configured to recognize a scene of an image to be acquired, and an image processing part configured to perform image processing on the image based on the image quality configured for the recognized scene by the image quality configuring part.

Further, according to another embodiment of the present disclosure, there is provided an image processing method including configuring image quality on a per-recognizable scene of an image basis according to an instruction from a user, recognizing a scene of an image to be acquired, and performing image processing on the image based on the image quality configured for the recognized scene.

Further, according to another embodiment of the present disclosure, there is provided a computer program causing a computer to function as an image processing device including an image quality configuring part configured to configure image quality on a per-recognizable scene of an image basis according to an instruction from a user, and configured to record the image quality in an image quality storage configured to store the image quality configured for each scene, an image recognition part configured to recognize a scene of an image to be acquired, and an image processing part configured to perform image processing on the image based on the image quality configured for the recognized scene by the image quality configuring part.

Further, according to another embodiment of the present disclosure, there is provided a computer-readable recording medium having a program recorded therein, the program causing a computer to function as an image processing device including an image quality configuring part configured to configure image quality on a per-recognizable scene of an image basis according to an instruction from a user, and configured to record the image quality in an image quality storage configured to store the image quality configured for each scene, an image recognition part configured to recognize a scene of an image to be acquired, and an image processing part configured to perform image processing on the image based on the image quality configured for the recognized scene by the image quality configuring part.

As described above, according to the embodiments of the present disclosure, the user can configure images of preference for individual scenes.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram illustrating a schematic configuration of an image capturing device according to an embodiment of the present disclosure;

FIG. **2** is a flowchart illustrating image capturing processing of the image capturing device according to the same embodiment;

FIG. **3** is an explanatory drawing illustrating configuring processing of setting information in an image quality configuring part;

FIG. **4** is an explanatory drawing illustrating one example of a setting screen for configuring constituents of image quality;

FIG. **5** is an explanatory drawing illustrating another example of a setting screen for configuring constituents of image quality;

FIG. **6** is an explanatory drawing illustrating another example of a setting screen for configuring constituents of image quality; and

FIG. **7** is a block diagram illustrating one exemplary configuration of hardware of an image capturing device according to the embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENT(S)

Hereinafter, preferred embodiments of the present disclosure will be described in detail with reference to the appended drawings. Note that, in this specification and the appended drawings, structural elements that have substantially the same function and structure are denoted with the same reference numerals, and repeated explanation of these structural elements is omitted.

Incidentally, description is made in the following order.

1. Schematic Configuration of Image Capturing Device
2. Image Capturing Processing of Image Capturing Device
2-1. Configuring Processing of Image Quality
2-2. Image Acquisition Processing in Image Capturing
3. Exemplary Configuration of Hardware

<1. Schematic Configuration of Image Capturing Device>

At first, a schematic configuration of an image capturing device **100** according to an embodiment of the present disclosure is described with reference to FIG. **1**. In addition, FIG. **1** is a block diagram illustrating a schematic configuration of an image capturing device **100** according to the embodiment.

The image capturing device **100** according to the embodiment is an image recording device such, for example, as a digital still camera and a camcorder. As illustrated in FIG. **1**, the image capturing device **100** includes an image sensor **101**, an A/D converter **102**, an image recognition block **103**, an image processing block **104**, a display part **105**, a camera control block **106** and a drive controller **107**. Furthermore, the image capturing device **100** includes an image quality configuring part **108** and an image quality storage **109**.

The image sensor **101** is an element on which light of the subject concentrated with a lens **10** is imaged. The image sensor **101** can employ a CMOS (Complementary Metal Oxide Semiconductor) image sensor, a CCD (Charge Coupled Device) image sensor or the like, for example. The image sensor **101** converts the light which is imaged on the relevant element and to be an image into electricity, and outputs it to the A/D converter **102**.

The A/D converter **102** converts analog information thus obtained from the image sensor **101** into digital information, and outputs it to the image recognition block **103**.

The image recognition block **103** includes a scene recognition part **103***a* demodulating the digital information thus inputted from the A/D converter **102** to recognizes in what kind of scene the user is performing image capturing, and a setting information acquiring part **103***b* acquiring setting information of image quality corresponding to the recognized scene. Scenes to be recognized by the image recognition block **103** include a face, a landscape, a night scene, a beach, snow (ski slopes or snow scenery) and the like, for example. The image recognition block **103** acquires setting values of constituents of image quality from the image quality storage **109**, which is mentioned later, using the setting information acquiring part **103***b* based on the scene of an image which scene is recognized by the scene recognition part **103***a*, and outputs them to the image processing block **104** along with the digital information.

The image processing block **104** performs signal processing in the setting values of image quality corresponding to the scene acquired by the image recognition block **103**. The image processing block **104** performs processing such, for example, as gradation representation, color reproduction (chroma and hue), white balance, edge enhancement, noise reduction. The image processing block **104** displays the image obtained by performing the signal processing on the display part **105**.

The display part **105** is an output part displaying an image, and can employ a liquid crystal display, an organic EL display or the like, for example.

The camera control block **106** performs camera control such as exposure control and aperture stop control in the setting values of image quality corresponding to the scene acquired by the image recognition block **103**. The camera control block **106** outputs control information for controlling the lens **10** and the like to the drive controller **107**. The drive controller **107** controls a driving part (not shown) driving the lens **10** and the like based on the control information thus inputted from the camera control block **106**. The camera control block **106** and drive controller **107** perform real-time processing.

The image quality configuring part **108** is an input configuration part configuring image quality of user's preference according to instruction from the user for individual scenes recognizable by the image capturing device **100**. The image quality configuring part **108** can be configured of an input part **108***a* such, for example, as a touch panel, and a configuration processing part **108***b* configuring image quality for each scene based on input information from the input part **108***a* to record it in the image quality storage **109** mentioned later. Based on the image quality configured by the image quality configuring part **108**, the image processing block **104** performs the image processing. Moreover, based on the image quality configured by the image quality configuring part **108**, the camera control block **106** performs the camera control.

The image quality storage **109** stores setting information of image quality for each scene which information is configured by the image quality configuring part **108**. Moreover, the image quality storage **109** can also record setting information of image quality for each scene for each user. The setting information of image quality stored in the image quality storage **109** is acquired by the image recognition block **103**, and is used for the signal processing in the image processing block **104** and the camera control in the camera control block **106**. In addition, the image quality storage **109** stores setting information of image quality (default values) preset in the image capturing device **100** along with the setting information of image quality for each scene which information is configured by the user. The default values are used for configuration of image quality in case of the image capturing device **100** not being able to perform scene recognition or the like.

<2. Image Capturing Processing of Image Capturing Device>

Next, image capturing processing of the image capturing device **100** according to the embodiment is described. The image capturing device **100** according to the embodiment can configure an image of user's preference for each recognizable scene, and can acquire an image in image quality configured according to a scene recognized from a captured image. For the purpose, at first, the user configures image quality for each scene recognizable by the image capturing device **100**. The image capturing device **100** recognizes the subject in image capturing, and for a scene to which image quality is configured, acquires an image based on the settings.

Hereinafter, based on FIG. **2** to FIG. **6**, configuring processing of image quality and image acquisition processing in image capturing as the image capturing processing of the image capturing device **100** are described. In addition, FIG. **2** is a flowchart illustrating image capturing processing of the image capturing device **100** according to the embodiment of the present disclosure. FIG. **3** is an explanatory drawing illustrating configuring processing of setting information in the image quality configuring part **108**. FIG. **4** is an explanatory drawing illustrating one example of a setting screen on which configuring constituents of image quality is performed. FIG. **5** and FIG. **6** are explanatory drawings illustrating another example of a setting screen on which configuring constituents of image quality is performed.

[2-1. Configuring Processing of Image Quality]

At first, the configuring processing of configuring constituents of image quality for each scene (S**101** and S**102**) is described. As illustrated in FIG. **2**, this configuring processing is previously performed before image capturing. At first, the user configures an image of preference for each scene recognizable by the image capturing device **100** using the image quality configuring part **108** of the image capturing device **100** (S**101**). Such recognizable scenes include, for example, a face, a landscape, a night scene, a beach, snow (ski slopes or snow scenery) and the like as mentioned above. Moreover, constituents of the image include, for example, brightness, contrast, chroma, white balance, edge enhancement, noise reduction and the like.

Specifically, the constituents of the image can be configured using a touch panel provided as an input part **108***a* in the image capturing device **100**, for example, in an operation

screen **200** illustrated in FIG. **3**. The touch panel illustrated in FIG. **3** is provided on the display part **105**, and the user can perform processes according to contact positions and input operations by touching and operating individual objects in the display screen **200** displayed on the display part **105**.

The operation screen **200** in FIG. **3** is provided with a scene selection part **210** for, in configuring image quality, selecting each scene recognizable by the image capturing device **100** and a constituent selection part **220** for selecting constituents of image quality to be configured. Furthermore, the operation screen **200** is provided with a representative image display area **230** for indicating a representative image for the scene in configuring and an adjustment palette **240** for adjusting the constituents of image quality to be configured.

The scene selection part **210** includes scene buttons for selecting a scene to be configured. As illustrated in FIG. **3**, the scene buttons include, for example, a "landscape" button (**210***a*) selected when configuring image quality of a landscape and a "person" button (**210***b*) selected when configuring image quality of a person, and other than these, can also include a "SCN A" button (**210***c*) and a "SCN B" button (**210***d*) corresponding to other scenes. Such other scenes include, for example, a night scene, a beach and the like as mentioned above.

The constituent selection part **220** includes setting item buttons for selecting constituents of image quality to be configured. As illustrated in FIG. **3**, the setting item buttons include, for example, an "item A" button **220***a*, an "item B" button **220***b* and an "item C" button **220***c*. In the embodiment, two constituents can be adjusted for each setting item simultaneously. For example, brightness and contrast can be adjusted for the item A, chroma and white balance can be adjusted for the item B, and edge enhancement and noise reduction can be adjusted for the item C. The adjustment of the constituents of image quality is performed using the adjustment palette **240** mentioned later. In addition, the present technology is not limited to such examples of the constituent selection part **220**, but this part may enable adjustment of only one constituent or may be able to adjust three or more items simultaneously, for each setting item.

The representative image display area **230** is a region where a representative image for each scene is displayed. The representative image is a typical image which is for each scene and is beforehand registered, and is used for notifying, to the user, picture imagery of the image acquired based on change in image quality in configuring image quality for each scene. The image in the representative image display area **230** is changed by the configuration processing part **108***b* according to change in settings of constituents of image quality.

The adjustment palette **240** is an input area for adjusting constituents of image quality to be configured. For example, when two constituents can be adjusted for each setting item in the constituent selection part **220** simultaneously, the adjustment palette **240** can be configured as two-dimensional coordinates in which the horizontal axis and the vertical axis are assigned to setting values of the respective constituents as illustrated in FIG. **3**. Specifically, when the "item A" is adjusted, for example, the horizontal axis is assigned to the setting value of brightness and the vertical axis is assigned to the setting value of contrast. The configuration processing part **108***b* acquires the setting values of the constituents of image quality corresponding to positions designated by the user on the adjustment palette **240**, and changes, in real time, the image quality of the image displayed in the representative image display area **230** based on the relevant setting values.

In addition, in place of the adjustment palette **240** illustrated in FIG. **3**, for example, a adjustment screen **250** illustrated in FIG. **4** may be displayed in adjusting image quality. Similarly to the adjustment palette **240** in FIG. **3**, when two constituents can be adjusted for each setting item in the constituent selection part **220** simultaneously, the adjustment screen **250** can be configured as two-dimensional coordinates in which the horizontal axis and the vertical axis are assigned to setting values of the respective constituents. At this stage, a plurality of patterns of representative images for which the setting values of the respective constituents are changed are arranged into a matrix shape. For example, in FIG. **4**, images brighter are arranged as they go to the right on the horizontal axis for which image brightness is configured, and images stronger in contrast as they go to the top on the vertical axis for which image contrast is configured, corresponding to the two-dimensional coordinates. Thereby, the user is easy to grasp picture imagery of the image after the change in adjusting the setting values and operation performance is improved.

The user selects a scene for which image quality is to be configured using the scene selection part **210** in the operation screen **200** illustrated in FIG. **3**, and selects constituents of image quality to be configured for the selected scene using the constituent selection part **220**. This enables adjustment of the constituents of image quality for the scene, which is selected using the scene selection part **210**, using the adjustment palette **240**. Determination of setting values of the constituents may include allowing the user to determine affirmative or negative of the change with a pop-up screen displayed for confirming the affirmative or negative of the change, for example, when the user pushes another scene button in the scene selection part **210** or pushes another setting item button in the constituent selection part **220**. Otherwise, a determination button for determining the setting values after the change or a cancel button for cancelling the change may be provided in the operation screen **200** or the adjustment screen **250**.

Returning to the description of FIG. **2**, in step S**101**, after image quality for a certain scene is configured and determined using the operation screen **200** in FIG. **3** or the adjustment screen **250** in FIG. **4**, the configuration processing part **108***b* records setting values after change of individual constituents of the image in the image quality storage **109** (S**102**). At this stage, the image quality storage **109** stores the setting values of the constituents of image quality for each scene.

As above, the configuring processing of configuring constituents of image quality for each scene is described. In addition, the operation screen **200** in FIG. **3** or the adjustment screen **250** in FIG. **4** is indicated as the input part **108***a* of the image quality configuring part **108** configuring image quality for each scene, whereas the present technology is not limited to such examples. For example, image quality for each scene can also be adjusted using an operation screen **300** as illustrated in FIG. **5** or an adjustment screen **400** illustrated in FIG. **6**.

In the operation screen **300** illustrated in FIG. **5**, representative images **310***a* to **310***d* for individual scenes which can be configured are displayed, and the scene to be adjusted can be determined by selecting the representative images **310***a* to **310***d*. Similarly to FIG. **3**, the operation screen **300** is provided with a constituent selection part **320** including setting item buttons for selecting constituents of image quality to be configured, and the constituents of image quality to be adjusted for the selected scene can be selected using the setting item buttons **320***a* to **320***c*. The selected constituents of image quality can also be adjusted using an operation palette **330** similarly to FIG. **3**. The configuration processing part **108***b* changes image quality of the representative image for the scene in configuring based on setting values of the respective constituents at a designated position according to

the position which the user designates on the operation palette **330**. Thereby, the user can confirm picture imagery in case of the setting values to be changed as the representative image, operating the operation palette **330**.

Moreover, in an adjustment screen **400** illustrated in FIG. **6**, a plurality of changing candidate images **410** obtained by changing setting values of a representative image for a scene to be configured, for each constituent of image quality, are displayed, and image quality is configured by selecting a desired picture imagery from the plurality of changing candidate images **410**. For example, an adjustment screen **400***a* for brightness, an adjustment screen **400***b* for contrast, an adjustment screen **400***c* for chroma, an adjustment screen **400***d* for white balance, an adjustment screen **400***e* for edge enhancement, an adjustment screen **400***f* noise reduction and the like are displayed sequentially, and setting values of the respective constituents are determined sequentially. At this stage, the configuration processing part **108***b* fixes, for the constituent to which the setting value has been determined, the relevant setting value, and generates changing candidate images **410** to be presented in the adjustment screen **400** for the next constituent.

Accordingly, in case of adjusting brightness of the image at first, a plurality of changing candidate images **410** obtained by changing the setting value for brightness relative to the default image of a representative image for a scene to be configured are displayed in the adjustment screen **400***a* for brightness. In case of configuring contrast next, a plurality of changing candidate images **410** obtained by fixing the setting value for brightness, which has been configured using the adjustment screen **400***a* for brightness, and changing the setting value for contrast are displayed in the adjustment screen **400***b* for contrast. Thus, sequential determination of the setting values of the respective constituents using the respective adjustment screens **400** generates the setting information of image quality of user's preference eventually. The configuration of image quality using the adjustment screen **400** in FIG. **6** is performed for each scene.

[2-2. Image Acquisition Processing in Image Capturing]

Next, image acquisition processing in image capturing (S**110** to S**115**) is described. In image capturing, the image capturing device **100**, at first, determines whether or not scene recognition processing of recognizing a scene for which an image is to be captured in the scene recognition part **103***a* of the image recognition block **103** is performed (S**110**). The presence or absence of performing the scene recognition processing can be determined from performing processing information for managing processing performed by the image capturing device **100**.

When the image capturing device **100** performs the scene recognition processing, the scene recognition part **103***a* determines a scene for which an image is about to be captured with the scene recognition processing using a technique for recognizing a scene of the subject (for example, see Japanese Patent Application Publication No. 2009-194437) (S**111**). Japanese Patent Application Publication No. 2009-194437 mentions a scene recognition technique of extracting concentration values of R, G and B in a captured image generated by capturing an image of the subject according to image capturing parameters configured, and determining a scene candidate of the subject based on individual averages of the concentration values of R, G and B.

Once the scene for which an image is about to be captured is recognized by the scene recognition part **103***a* in step S**110**, the image recognition block **103** acquires setting information of image quality corresponding to the recognized scene from the image quality storage **109** using the setting information acquiring part **103***b*. Then, the setting information acquiring part **103***b* outputs the acquired setting information of image quality to the image processing block **104** and camera control block **106**. After that, the camera control block **106** performs camera control based on the setting information thus inputted, and captures the image of the subject (S**112**). Moreover, the image processing block **104** performs signal processing on the image based on the setting information thus inputted, and displays the image of the subject, which is about to be captured, on the display part **105** (S**113**). Thereby, the image capturing device **100** can acquire and present the image in which the user's preference is reflected for each scene.

On the other hand, when any scene for which an image is about to be captured is not recognized by the scene recognition part **103***a* in step S**110**, the image recognition block **103** acquires default values of image quality from the image quality storage **109** using the setting information acquiring part **103***b*. Then, the setting information acquiring part **103***b* outputs the acquired default values of image quality to the image processing block **104** and camera control block **106**. After that, the camera control block **106** performs camera control based on the default values thus inputted, and captures the image of the subject (S**114**). Moreover, the image processing block **104** performs signal processing on the image based on the default values thus inputted, and displays the image of the subject, which is about to be captured, on the display part **105** (S**115**).

As above, the image capturing processing using the image capturing device **100** according to the embodiment is described. According to the image capturing device **100** according to the embodiment, when the scene recognition is performed, an image can be acquired according to the scene recognition result based on the setting information of image quality beforehand configured by the user. Therefore, an image in which the user's preference is reflected for each scene can be acquired.

Moreover, when image information of the acquired image is associated with preference (settings of image quality) in which the image is captured, a tendency of the user's preference for each scene can also be grasped on the occasion of the captured image uploaded on a server. Collecting and analyzing tendencies of preference of image quality for individual scenes can be utilized for the determination or the like of default values of image quality in the image capturing device **100**.

Furthermore, a communication part (not shown) of transmitting and receiving information to and from the image capturing device **100** may be provided, and setting information of image quality for each scene which is configured by each user may be communicated between different image capturing devices **100**. Thereby, when having found an image of preference captured by another user, the user can omit a step of configuring image quality for the relevant scene in the image quality configuring part **108**, by obtaining setting information of image quality for the relevant scene by transmitting it between the image capturing devices **100**.

<3. Exemplary Configuration of Hardware>

The processing performed by the image capturing device **100** according to the embodiment can also be performed by hardware or can also be performed by software. In such cases, the image capturing device **100** can also be configured as illustrated in FIG. **7**. Hereinafter, one exemplary configuration of hardware of the image capturing device **100** according to the embodiment is described based on FIG. **7**.

As mentioned above, the image capturing device **100** according to the embodiment can be implemented by a processing device such as a computer. As illustrated in FIG. **7**, the

image capturing device **100** includes a CPU (Central Processing Unit) **901**, a ROM (Read Only Memory) **902**, a RAM (Random Access Memory) **903** and a host bus **904***a*. Furthermore, the image capturing device **100** includes a bridge **904**, an external bus **904***b*, an interface **905**, an input device **906**, an output device **907**, a storage (HDD) **908**, a drive **909**, a connection port **911** and a communication device **913**.

The CPU **901** functions as a processing device and a control device, and controls overall operations inside the image capturing device **100** according to various programs. Moreover, the CPU **901** may be a microprocessor. The ROM **902** stores programs used by the CPU **901**, operation parameters and the like. The RAM **903** temporarily stores programs used for performance of the CPU **901**, parameters and the like appropriately changing during such performance. These are connected to one another via the host bus **904***a* constituted of a CPU bus and the like.

The host bus **904***a* is connected to an external bus **904***b* such as a PCI (Peripheral Component Interconnect/Interface) bus via the bridge **904**. In addition, the host bus **904***a*, bridge **904** and external bus **904***b* are not necessarily configured separately, but these functions may be implemented into one bus.

The input device **906** is configured of input instruments such as a mouse, a keyboard, a touch panel, buttons, a microphone, switches, levers which an instrument is for the user inputting information, input control circuits which generate input signals based on the input from the user and output them to the CPU **901** and the like. The output device **907** includes a display device such, for example, as a liquid crystal display (LCD) device, an OLED (Organic Light Emitting Diode) device and a lamp, and a voice output device such as a loud speaker.

The storage **908** is one example of the storage of the image capturing device **100**, and is a device for storing data. The storage **908** may include a storing medium, a recording device recording data in the storing medium, a readout device reading out data from the storing medium, a deleting device deleting data recorded in the storing medium and the like. The storage **908** is configured of an HDD (Hard Disk Drive), for example. This storage **908** drives the hard disk drive, and stores programs executed by the CPU **901** and various kinds of data.

The drive **909** is a storing medium reader/writer, and is built in the image capturing device **100** or is provided externally. The drive **909** reads out information recorded in a mounted removable recording medium such as a magnetic disk, an optical disk, a magneto-optical disk or a semiconductor memory to output it to the RAM **903**.

The connection port **911** is an interface connected to external equipment, and is a connection port to external equipment to which data can be transmitted via a USB (Universal Serial Bus) and the like, for example. Moreover, the communication device **913** is a communication interface configured of a communication device and the like for connecting to a communication network **5**, for example. Moreover, the communication device **913** may be a communication device compatible with a wireless LAN (Local Area Network) or a communication device compatible with a wireless USB or a wired communication device communicating in a wired manner.

It should be understood by those skilled in the art that various modifications, combinations, sub-combinations and alterations may occur depending on design requirements and other factors insofar as they are within the scope of the appended claims or the equivalents thereof.

For example, configuring constituents of image quality for each scene is described in the above-mentioned embodiments, whereas the present disclosure is not limited to such examples. For example, preference of image quality for each scene for a plurality of users may be configured. In this case, setting information of image quality for each scene is managed for each user in the image quality storage **109**. Moreover, at the beginning of use of the image capturing device **100**, user information of the relevant device is allowed to be inputted. Thereby, when acquiring setting information corresponding to a recognized scene from the image quality storage **109**, the image recognition block **103** can acquire setting information of image quality corresponding to the user of the image capturing device **100**.

Moreover, in the above-mentioned embodiments, the image recognition block **103** recognizing a scene for which an image is captured, the image processing block **104**, the image quality configuring part **108** configuring image quality for each scene, and the image quality storage **109** storing setting information of image quality for each scene are provided in the body of the image capturing device **100**. However, the present disclosure is not limited to such an example, but at least one of these functional parts may be provided in an information processing device separate from the image capturing device **100**, and performance of processing and management of information may be performed therein. Moreover, processing of these functional parts may be performed in a server which can communicate via a network, and receiving processing results from the relevant server, the image capturing device **100** side may perform image processing and camera control based on the processing results.

Additionally, the present technology may also be configured as below.

(1) An image processing device including:

an image quality configuring part configured to configure image quality on a per-recognizable scene of an image basis according to an instruction from a user;

an image quality storage configured to store the image quality configured for each scene;

an image recognition part configured to recognize a scene of an image to be acquired; and

an image processing part configured to perform image processing on the image based on the image quality configured for the recognized scene by the image quality configuring part.

(2) The image processing device according to (1),

wherein the image quality configuring part is configured to include

a constituent configuring part configured to configure at least one constituent of image quality for each recognizable scene, and

a configuration processing part configured to display a representative image for each scene in the configured image quality.

(3) The image processing device according to (2),

wherein the configuration processing part is configured to display a plurality of changing candidate images obtained by changing a setting value for the constituent of image quality, and is configured to determine a setting value of a changing candidate image selected from the plurality of changing candidate images as a setting value for the constituent of image quality.

(4) The image processing device according to (3),

wherein the configuration processing part is configured to arrange and display, into a matrix shape, a plurality of changing candidate images obtained by changing setting values for two constituents of image quality.

(5) The image processing device according to any one of (2) to (4),

wherein the configuration processing part is configured to update the representative image in real time based on a setting value configured by the constituent configuring part.

(6) The image processing device according to any one of (1) to (5), further including:

an image capturing part configured to capture an image,

wherein an image on which the image processing part is configured to perform image processing is the image captured by the image capturing part.

The present disclosure contains subject matter related to that disclosed in Japanese Priority Patent Application JP 2012-024775 filed in the Japan Patent Office on Feb. 8, 2012, the entire content of which is hereby incorporated by reference.

What is claimed is:

1. An image processing device comprising:

an image quality configuring part configured to configure image quality of a recognizable scene of an image according to an instruction from a user;

an image quality storage configured to store the image quality configured for the recognizable scene;

an image recognition part configured to recognize a scene of an image to be acquired; and

an image processing part configured to perform image processing on the image to be acquired based on the image quality configured by the image quality configuring part for the scene recognized by the image recognition part, wherein the image quality comprises at least one constituent for the recognizable scene, and

wherein a setting value for the at least one constituent of the image quality is determined based on a setting value of a changing candidate image selected from a displayed plurality of changing candidate images.

2. The image processing device according to claim **1**, wherein the image quality configuring part comprises:

a configuration processing part configured to display a representative image for the recognizable scene in the configured image quality.

3. The image processing device according to claim **2**, wherein the configuration processing part is configured to update the representative image in real time based on the setting value configured by the image quality configuring part.

4. The image processing device according to claim **1**, further comprising:

an image capturing part configured to capture an image, wherein the image to be acquired on which the image processing part is configured to perform image processing is the image captured by the image capturing part.

5. An image processing device, comprising:

an image quality configuring part configured to configure image quality of a recognizable scene of an image according to an instruction from a user;

an image quality storage configured to store the image quality configured for the recognizable scene;

an image recognition part configured to recognize a scene of an image to be acquired; and

an image processing part configured to perform image processing on the image to be acquired based on the image quality configured by the image quality configuring part for the scene recognized by the image recognition part, wherein the image quality configuring part comprises:

a constituent configuring part configured to configure at least one constituent of the image quality for each the recognizable scene, and

a configuration processing part configured to display a representative image for the recognizable scene in the configured image quality, and

wherein the configuration processing part is configured to display a plurality of changing candidate images obtained by changing a setting value for the at least one constituent of the image quality, and is configured to determine a setting value of a changing candidate image selected from the plurality of changing candidate images as the setting value for the at least one constituent of the image quality.

6. The image processing device according to claim **5**, wherein the configuration processing part is configured to arrange and display in a matrix shape, the plurality of changing candidate images obtained by changing the setting value for two constituents of image quality.

7. An image processing method comprising:

configuring image quality of a recognizable scene of an image according to an instruction from a user;

configuring at least one constituent of the image quality for the recognizable scene;

displaying a representative image for the recognizable scene in the configured image quality;

displaying a plurality of changing candidate images obtained by changing a setting value for the at least one constituent of image quality;

determining a setting value of a changing candidate image selected from the plurality of changing candidate images as a setting value for the at least one constituent of image quality;

recognizing a scene of an image to be acquired; and

performing image processing on the image based on the setting value of the at least one constituent of the image quality configured for the recognized scene.

8. A non-transitory computer-readable recording medium having instructions recorded therein which, when executed by a processor, cause the processor to function as an image processing device including:

an image quality configuring part configured to:

configure image quality of a recognizable scene of an image according to an instruction from a user, and

record the image quality in an image quality storage configured to store the image quality configured for the recognizable scene;

an image recognition part configured to recognize a scene of an image to be acquired; and

an image processing part configured to perform image processing on the image to be acquired based on the image quality configured by the image quality configuring part for the scene recognized by the image recognition part, wherein the image quality comprises at least one constituent for the recognizable scene, and

wherein a setting value for the at least one constituent of the image quality is determined based on a setting value of a changing candidate image selected from a displayed plurality of changing candidate images.

9. The image processing method according to claim **8**, further comprising:

arranging and displaying in a matrix shape, the plurality of changing candidate images obtained by changing setting values for two constituents of the image quality.

10. The image processing method according to claim 8, further comprising updating the representative image in real time based on the setting value for the at least one constituent of the image quality.

11. A non-transitory computer-readable recording medium having instructions recorded therein which, when executed by a processor of an image processing device, cause the processor to cause the image processing device to perform an image processing method comprising:

configuring image quality of a recognizable scene of an image according to an instruction from a user;

configuring at least one constituent of the image quality for the recognizable scene;

displaying a representative image for the recognizable scene in the configured image quality;

displaying a plurality of changing candidate images obtained by changing a setting value for the at least one constituent of image quality;

determining a setting value of a changing candidate image selected from the plurality of changing candidate images as a setting value for the at least one constituent of image quality;

recognizing a scene of an image to be acquired; and

performing image processing on the image based on the setting value of the at least one constituent of the image quality configured for the recognized scene.

12. The computer-readable medium according to claim 11, wherein configuring image quality further comprises:

arranging and displaying, into a matrix shape, the plurality of changing candidate images obtained by changing setting values for two constituents of image quality.

13. The computer-readable medium according to claim 11, wherein configuring image quality further comprises:

updating the representative image in real time based on the setting value for the at least one constituent of image quality.

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